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54 Title: device to cut tissue electrically during surgery

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Testing application per § 28b PatG[1] has been submitted.

[1] Translator's Note: PatG = Patentgesetz = German Patent Law

The invention concerns a device to cut and/or coagulate human tissue with the help of electrical high frequency current for application in surgery. The invention is generally applicable for cutting material similar to human tissue, i.e., it emits vaporous or gaseous products when adequately heated, and that it possesses adequate conductivity at high frequencies, or that it possesses insulating properties with adequately high losses, so that they are heated by high frequency current.

It is a known surgical procedure to cut human tissue with the help of sondes in the form of thin wires or thin blades whereby one applies high-frequency alternating current via the named sonde. Figure 1 shows the high frequency current circuit. For this, the generator 1 supplying the current via the supply line 2 to the sonde 4 and via the supply line 3 to an electrode 5 is connected to a suitable location on a human body 6. The thin sonde contacts the body at the location to be cut with a very small surface area, and thereby allows accumulation of a very high current density at the contact location. Because of the relatively large resistance loss of human tissue for high-frequency current, heating of the tissue occurs because of the alternating current, particularly because of the high current density in the immediate vicinity of the sonde contact location. To the extent that the tissue contains water or fat, i.e., it contains a substance that emits vapor at higher temperatures, alternating current at adequate strength causes vaporization within the tissue in the vicinity of the sonde contact location, thereby destroying cell walls. This causes separation of the tissue at the contact location. Displacement of the sonde causes constant cutting.

Patent Claim 1:

Device to cut and/or to coagulate human tissue with the help of an electrical high-frequency (HF) current in which the HF current is applied to the human tissue (6) from a generator (1) via a sonde (4) in the form of thin wires or thin-walled cutting blades, and a supply line (3) is provided to the electrode,

characterized in that

one or more display devices (7) are present that provide the status of the cutting or coagulation procedure continuously or at specific time intervals in the form of one or several electrical signals, and a regulation device (8) is present to which the electrical signal from the display device and a nominal-value program from a nominal-value sensor (9) is provided, and that derives a regulating voltage from these two pieces of data, and the generator (1) providing the HF current is configured so that the current strength of the HF current is adjusted to the value pre-determined by nominal-value program by means of the regulating voltage supplied to the generator.